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TELEX 420899
TWX 212-571-1844

January 12, 1966

Mr. T. Nelson
Box 1546
Poughkeepsie, New York 12603

SUBJECT: Mercury Wetted Contact Relay
Type REL 300
Type REL 301

Dear Mr. Nelson:

With reference to your inquiry to the October issue of "Computer Design" magazine, we are pleased to enclose brochure describing the Mercury Wetted Contact Relays, Type REL 300 and Type REL 301.

These mercury wetted relays are available in sample lots with delivery approximately 4 to 6 weeks after receipt of order.

Please inform us of your requirements indicating coil, electrical characteristics, etc. of the specific units of interest and upon receipt of this information, we will furnish you with a quotation to satisfy your needs.

We thank you for your valued inquiry and look forward to hearing from you as to your requirements.

Very truly yours,

J. T. Benjamin,
Vice President

JTB/ml

Enclosure

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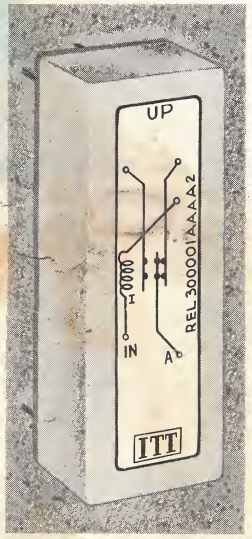
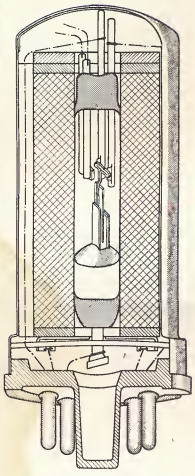
ITT Standard



# MERCURY WETTED CONTACT RELAY

**TYPE REL 300**
**(printed circuit board)**

**TYPE REL 301**
**(octal plug-in)**

Life : 1 billion operations minimum
High current : 5 Amps
Completely no bounce
No contact wear
Low and constant contact resistance
MAKE BEFORE BREAK
(Bridging contact)
Fast operation

TYPE REL 300 Fig. 1 TYPE REL 301 Fig. 2

## APPLICATION

Computing, sorting and tabulating machines
Relay amplifiers
Servo-mechanisms
Signalling devices.

## DESCRIPTION

The relays REL 300 and 301 incorporate the SWC 7000 contacts which owe their long life to a hermetically sealed glass capsule which encloses the contact assembly with a small pool of mercury in a pressurised hydrogen atmosphere. A film of mercury wets the contacts, renewing the contacting surfaces by capillary action after each operation.
The relays contain one switch which is located in a suitable coil.
The coils may be single or concentrically double wound. Printed circuit board (type 300) or octal plug-in (type 301) versions are available.

**MAC 6816 - 10 - 3 E**

The entire assembly of the plug-in version is potted in high melting point wax and encased in a steel container.

This cover minimizes the influence of surrounding relays. The printed circuit version is encapsulated in a plastic shell and can be supplied for modules of :

2,54 x 2,54 mm.
or 3,81 x 5,08 mm.

## CONTACT CHARACTERISTICS

**Ratings** (with recommended contact protection)

Current - 5 amperes maximum (AC or DC)
Voltage - 500 volts maximum (AC or DC)
Wattage - 250 VA maximum
Breakdown voltage 1500 volts

**Contact resistance**

40 milliohms nominal with maximum deviation of 2 milliohms.

## LIFE

More than $10^9$ operations at the specified ratings

## OPERATING CHARACTERISTICS

Must operate : 190 ampere-turns
Hold : 147 » »
Non operate : 124 » »
Must release : 84 » »

## OPERATING AND RELEASE TIMES

1) Time to close normally open contacts : see fig. 3.
2) Time to open normally closed contacts : add max. 1 millisec. to time shown on fig. 3.
Note : Bridging time is 1 millisec. maximum.
3) Time to release normally open contacts :
3.5 ± 0,6 millisec.

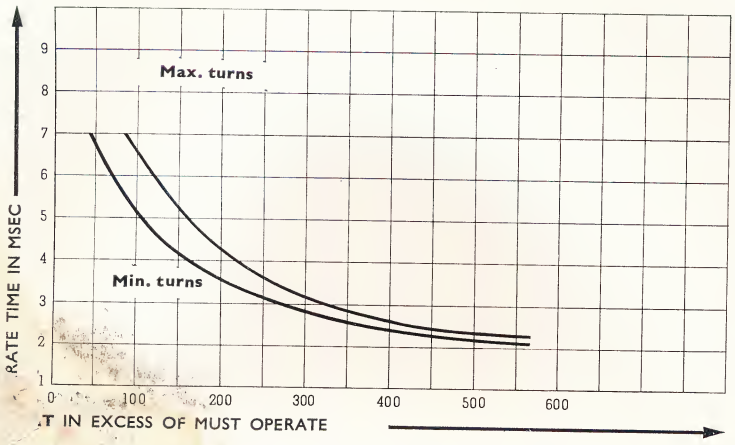



Fig. 3 : Time to close normally open contacts.

NOTE :

The time difference illustrated is due to the RL time constant difference between coils of many turns and coils of few turns.

**ACT ACTION**

**Form « D »**

**Make before break**

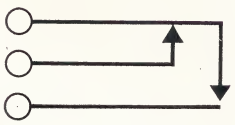
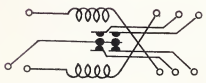


Fig. 4.

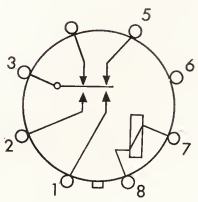
**WIRING**

Relays have been developed with the following wiring patterns :

**1. Normal**



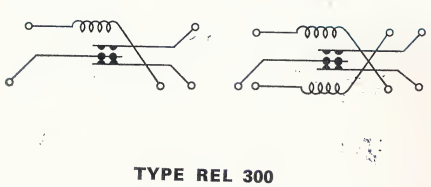
**TY E REL 300**



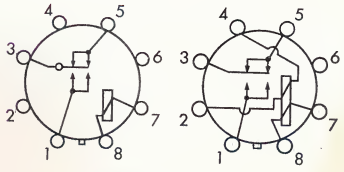

**TYPE REL 301**

Fig. 5.

**2. For maximum power handling**



**TYPE REL 300**




**TYPE REL 301**

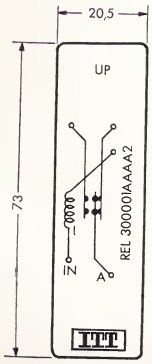
Fig. 6.

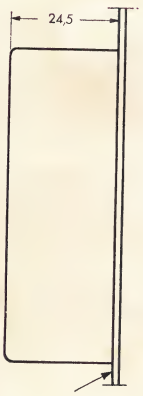
## MOUNTING

These relays should be mounted in a upright position with a maximum deviation from the vertical of 30°.

## DIMENSIONS

**1. Printed circuit type. TYPE REL 300.**




Vertical mounting centre : min. 74 mm.
Horizontal mounting centre : min. 21,5 mm.

Printed circuit plate

Fig. 7a : dimensions TYPE REL 300.

## ORDERING INFORMATION

**MERCURY WETTED CONTACT RELAY**

**TYPE REL 300 (Printed circuit board)**

Please direct your inquiries
for
imported and exported
ITT PRODUCTS
to
ITT EXPORT CORPORATION
250 Broadway
New York, N.Y. 10007

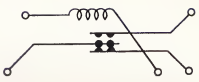


FIG. 1

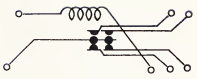


FIG. 2

| CODE NUMBER | WIRING DIAGRAM | COIL | | ELECTRICAL CHARACTERISTICS | | VOLTAGE | |
|---|---|---|---|---|---|---|---|
| | | Turns | Resistance ± 10 % | Must operate mA | Must release mA | Must operate | Max. |
| REL 300001 AAAA * | Fig. 1 | 4300 | 180 Ω | 45 | | 8,9 V | 17,7 V |
| REL 300011 AAAA * | Fig. 2 | 4300 | 180 Ω | 45 | | 8,9 V | 17,7 V |
| REL 300001 ABAB * | Fig. 1 | 7825 | 775 Ω | 25 | | 21,3 V | 37,3 V |
| REL 300011 ABAB * | Fig. 2 | 7825 | 775 Ω | 25 | | 21,3 V | 37,3 V |
| REL 300001 ACAC * | Fig. 1 | 14000 | 2000 Ω | 16 | | 35,2 V | 59,4 V |
| REL 300011 ACAC * | Fig. 2 | 14000 | 2000 Ω | 16 | | 35,2 V | 59,4 V |
| REL 300001 ADAD | Fig. 1 | 5500 | 275 Ω | 35 | | 10,5 V | 22 V |
| REL 300011 ADAD | Fig. 2 | 5500 | 275 Ω | 35 | | 10,5 V | 22 V |

* PREFERRED TYPES

## ORDERING INFORMATION

### MERCURY WETTED CONTACT RELAY

### TYPE REL 301 (Octal plug-in)

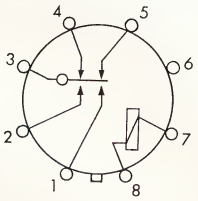



FIG. 1

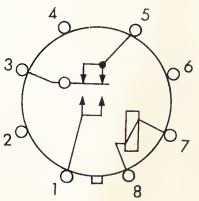


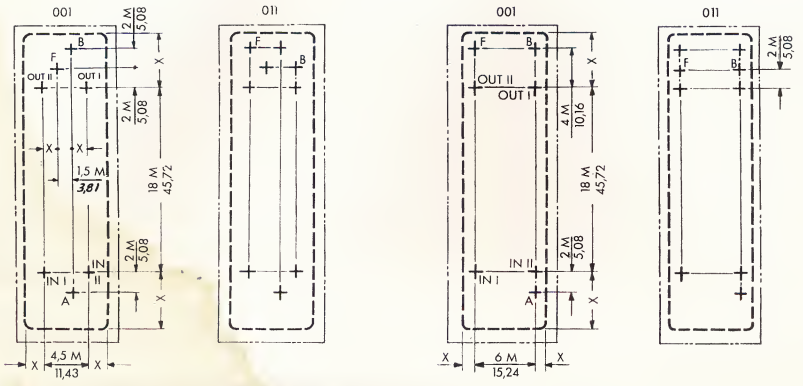

FIG. 2

| CODE NUMBER | WIRING DIAGRAM | COIL | | ELECTRICAL CHARACTERISTICS | | VOLTAGE | |
|---|---|---|---|---|---|---|---|
| | | Turns | Resistance ± 10 % | Must operate mA | Must release mA | Must operate | Max. |
| REL 301001 AAAA | Fig. 1 | 1800 | 45 Ω | 106 | | 5,24 V | 8,8 V |
| REL 301011 AAAA | Fig. 2 | 1800 | 45 Ω | 106 | | 5,24 V | 8,8 V |
| REL 301001 ABAB | Fig. 1 | 2400 | 65 Ω | 79 | | 5,64 V | 10,26 V |
| REL 301011 ABAB | Fig. 2 | 2400 | 65 Ω | 79 | | 5,64 V | 10,26 V |
| REL 301001 ACAC | Fig. 1 | 3200 | 95 Ω | 59,5 | | 6,21 V | 11,9 V |
| REL 301011 ACAC | Fig. 2 | 3200 | 95 Ω | 59,5 | | 6,21 V | 11,9 V |
| REL 301001 ADAD | Fig. 1 | 3700 | 130 Ω | 51,5 | | 7,35 V | 16,5 V |
| REL 301011 ADAD | Fig. 2 | 3700 | 130 Ω | 51,5 | | 7,35 V | 16,5 V |
| REL 301001 AEAE * | Fig. 1 | 4700 | 200 Ω | 40,5 | | 8,9 V | 18,9 V |
| REL 301011 AEAE * | Fig. 2 | 4700 | 200 Ω | 40,5 | | 8,9 V | 18,9 V |
| REL 301001 AFAF * | Fig. 1 | 6800 | 350 Ω | 28 | | 10,78 V | 24,9 V |
| REL 301011 AFAF * | Fig. 2 | 6800 | 350 Ω | 28 | | 10,78 V | 24,9 V |
| REL 301001 AGAG | Fig. 1 | 7500 | 500 Ω | 25,5 | | 14 V | 29,7 V |
| REL 301011 AGAG | Fig. 2 | 7500 | 500 Ω | 25,5 | | 14 V | 29,7 V |
| REL 301001 AHAH * | Fig. 1 | 8500 | 600 Ω | 22,5 | | 14,55 V | 32,4 V |
| REL 301011 AHAH * | Fig. 2 | 8500 | 600 Ω | 22,5 | | 14,55 V | 32,4 V |
| REL 301001 AJAJ | Fig. 1 | 10000 | 700 Ω | 19 | | 14,63 V | 34,6 V |
| REL 301011 AJAJ | Fig. 2 | 10000 | 700 Ω | 19 | | 14,63 V | 34,6 V |
| REL 301001 AKAK * | Fig. 1 | 11000 | 1000 Ω | 17,3 | | 19 V | 37,4 V |
| REL 301011 AKAK * | Fig. 2 | 11000 | 1000 Ω | 17,3 | | 19 V | 37,4 V |
| REL 301001 ALAL | Fig. 1 | 13000 | 1500 Ω | 14,6 | | 24,1 V | 49,9 V |
| REL 301011 ALAL | Fig. 2 | 13000 | 1500 Ω | 14,6 | | 24,1 V | 49,9 V |
| REL 301001 AMAM * | Fig. 1 | 15000 | 2200 Ω | 12,7 | | 30,73 V | 61,3 V |
| REL 301011 AMAM * | Fig. 2 | 15000 | 2200 Ω | 12,7 | | 30,73 V | 61,3 V |
| REL 301001 ANAN * | Fig. 1 | 20000 | 4000 Ω | 9,5 | | 41,8 V | 82,8 V |
| REL 301011 ANAN * | Fig. 2 | 20000 | 4000 Ω | 9,5 | | 41,8 V | 82,8 V |
| REL 301001 APAP * | Fig. 1 | 25000 | 5000 Ω | 7,6 | | 41,8 V | 94 V |
| REL 301011 APAP * | Fig. 2 | 25000 | 5000 Ω | 7,6 | | 41,8 V | 94 V |

* PREFERRED TYPES

**Drilling**

Rear view, copper side of printed circuit plate




(e.g. REL 300001 AAAA 1)

(e.g. REL 300001 AAAA 2)

Fig. 7b : Dimensions TYPE REL 300.

**2. Plug-in type REL 301**

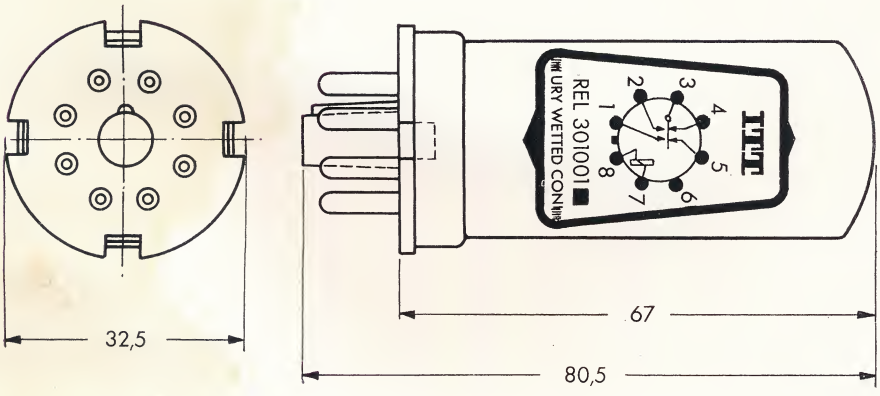



Fig. 8 : Dimensions TYPE REL 301.

## CONTACT PROTECTION

The contacts of the mercury switch must be protected by a R.C. sparkquencher calculated with the aid of the following formulae :

$$C = \frac{I^2}{10} \quad (1) \qquad R = \frac{E}{10.I^{\alpha}} \quad (2)$$

$$\alpha = 1 + \frac{50}{E}$$

C = capacitance in $\mu$F

I = current in Amperes

E = power supply voltage in volts.

For A.C. loads, peak values of E and I should be us

The minimum capacitance to be used is 0,001 mfd.

The minimum resistance to be used is 0,5 ohm

The allowed variation of R is given in
with the power supply as parame

| E | R variation |
|---|---|
| < 70 Volts | up to 3 times the obtained formula (2) |
| < 100 Volts | ± 50 % variation of the indicated va of formula (2) |
| < 150 Volts | ± 10 % variation of the indicated value of formula (2) |
| > 150 Volts | use ± 5 % of the indicated value. |

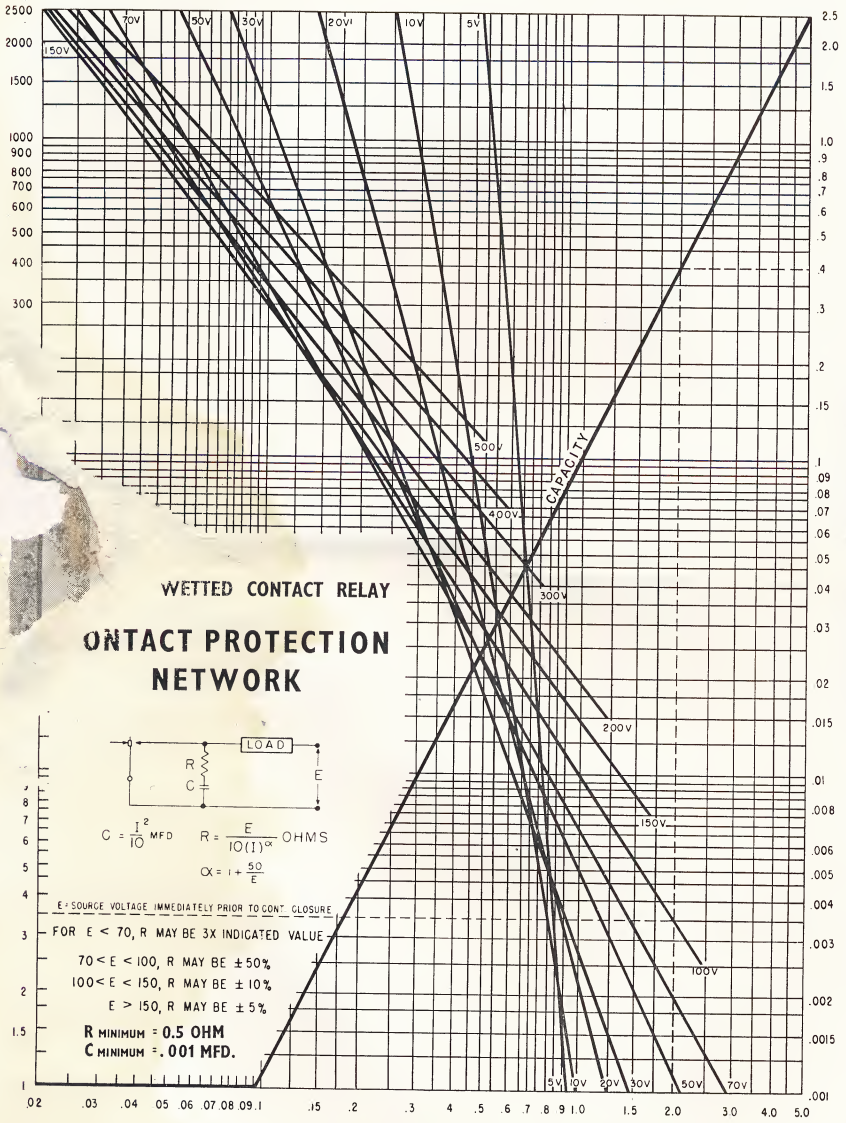



Fig. 9 : Contact protection network.

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